

**What is claimed is:**

1. A fuel cell system comprising:

a fuel cell supplied with air and fuel to generate electric power output;

a main air-flow passage supplying the air to the fuel cell;

an air treatment unit located in the main air-flow passage;

a bypass flow passage connected to the main air-flow passage in parallel with the air treatment unit; and

a flow-passage change-over valve executing a change-over between the main air-flow passage and the bypass flow passage and allowing the bypass flow passage to supply the air to the fuel cell during a start-up operation until a predefined condition is established.

2. A fuel cell system according to claim 1, wherein the bypass flow passage has an inner diameter smaller than that of the main air-flow passage.

3. A fuel cell system according to claim 1, further comprising:

a compressor supplying the air to the fuel cell;

a motor driving the compressor;

a start-up battery supplying electric power to the motor during the start-up operation; and

a power supply change-over switch allowing the start-up battery to be changed over to the fuel cell to supply electric power to the motor when it is detected that the fuel cell has reached an operating state to generate the electric power output at a given amount.

4. A fuel cell system according to claim 1, wherein the air treatment unit includes a heat exchanger.

5. A fuel cell system according to claim 1, wherein the air treatment unit includes a silencer.

6. A fuel cell system according to claim 1, wherein the flow-passage change-over valve selectively executes a change-over between the main air-flow passage and the bypass flow passage in response to the flow rate of air supplied to the fuel cell.

7. A fuel cell system according to claim 6, further comprising an air flow meter measuring the flow rate of the air and located downstream of a junction where the main air-flow passage and the bypass flow passage merge.

8. A fuel cell system according to claim 1, wherein the flow-passage change-over valve executes a change-over between the main air-flow passage and the bypass flow passage in response to a pressure of the air supplied to the fuel cell.

9. A fuel cell system according to claim 1, further comprising a pressure gauge measuring the pressure of the air and located downstream of a junction where the main air-flow passage and the bypass flow passage merge.

10. A fuel cell system according to claim 1, wherein the flow-passage change-over valve executes a change-over between the main air-flow passage and the bypass flow passage in response to the temperature of the air supplied to the fuel cell.

11. A fuel cell system according to claim 1, further comprising a temperature sensor measuring the temperature of the air supplied to the fuel cell and located downstream of a junction where the main air-flow passage and the bypass flow passage merge.

12. A fuel cell system according to claim 1, further comprising an air filter located downstream of a junction where the main air-flow passage and the bypass flow passage merge.

13. A fuel cell system according to claim 1, further comprising a humidifier located downstream of a junction where the main air-flow passage and the bypass flow passage merge.

14. A fuel cell system comprising:

- a fuel cell supplied with air and fuel to generate electric power output;

- a main air-flow passage supplying the air to the fuel cell;

- a bypass flow passage connected in parallel with the main air-flow passage and having a lower volume than that of the main air-flow passage; and

- a flow-passage change-over valve executing a change-over between the main air-flow passage and the bypass flow passage and allowing the bypass flow passage to supply the air to the fuel cell during start-up operation until a predefined condition is established.

15. A fuel cell system comprising:

- a fuel cell supplied with air and fuel to generate electric power output;

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a main air-flow passage supplying the air to the fuel cell;  
an air treatment unit having a silencer and a heat exchanger located in the main air-flow passage;

5 a bypass flow passage connected to the main air-flow passage in parallel with the main air-flow passage;

a flow-passage change-over valve executing a change-over between the main air-flow passage and the bypass flow passage and allowing the bypass flow passage to supply the air to the fuel cell during start-up operation until a predefined condition is established;

10 a compressor supplying the air to the fuel cell;

a motor driving the compressor;

a start-up battery supplying electric power to the motor during the start-up operation; and

15 a power supply change-over switch allowing the start-up battery to be changed over to the fuel cell to supply electric power to the motor when it is detected that the fuel cell has reached an operating state to generate the electric power output at a given amount,

wherein the bypass flow passage has an inner diameter smaller than the main air-flow passage.

20 16. A fuel cell system comprising:

a fuel cell supplied with air and fuel to generate electric power output;

main passage means for supplying the air to the fuel cell;

25 treating means for treating the air flowing through the main passage means;

bypass passage means for causing air to bypass the treating means; and

30 controlling means for executing a change-over between the main passage means and the bypass passage means and allowing the bypass passage means to supply the air to the fuel cell during start-up operation until a predefined condition is established.